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around the mines of Gellivare; and that further northwest, at Kirunavaara, on the line of the railroad, is a ridge 700 feet in height and several miles long of solid magnetic iron ore, which is estimated to contain over 200,000,000 tons of ore. It is expected soon to begin the development of this source of wealth.

The cost of building the railroad was borne by Sweden and Norway. The engineering difficulties among the mountains in Norway were considerable. The mountains are crossed through the rugged North Valley, in which twenty tunnels, aggregating over two and a half miles, were excavated and several bridges were built, the largest being 591 feet in length and 120 feet above the valley at its highest point.

An ore dock, nearly 1,000 feet in length, and built after the best modern plans with large storage bins, is now being constructed at Victoria Haven. The road will give easy access to the Norbotten (North Bothnia) district of Sweden, which, besides its deposits of iron ore, has considerable agricultural resources that will be developed with the aid of these new transportation facilities.

GEOGRAPHICAL RECORD.

AMERICA.

PLACE NAMES IN THE UNITED STATES.—Bulletin 197 of the United States Geological Survey is a compilation by Mr. Henry Gannett, giving the origin of about 10,000 place names in the United States. It is filled with interesting information as to the various sources from which we have derived our geographical names. We learn that Book Plateau, in Colorado, was so called on account of its shape; Bombay, in Franklin County, N. Y., was named by Mr. Hogan, an early settler, whose wife had lived in Bombay, India; counties in seven States, besides towns and lakes, were named after Daniel Boone; ten counties and towns were named Bolivar, in honour of the military hero of South America; Block Island, R. I., was named for Adrien Block, the Dutch discoverer; Binghamton, N.Y., was named after William Binghamton, of Philadelphia, a benefactor of the town; Golden Gate, Cal., was named by Col. Fremont before the discovery of gold in that region because of the brilliant effect of the setting sun on the cliffs and hills;

Newport News was named after Captain Christopher Newport and Captain Newce; Nyack is an Indian word meaning corner or point; Painted Post, a village of Steuben County, N. Y., was so named because of a painted post erected by Indians over the grave of their chief; Pawtucket is an Indian word meaning "at the little falls"; Quogue is an Indian word meaning clam; Tarrytown is a modification of its former name, Terwen* (Wheat Town), given on account of its large crops of that cereal; Yonkers was named for a manor house built by the Dutch, the word meaning "Young Lord"; Haverstraw, named by the early Dutch Haverstroo, means oats straw. Of course, the *villes*, *boros*, and *burgs*, with the names of earlier settlers or prominent men, are very numerous. The *Bulletin* is a valuable addition to the nomenclature of the country—a subject not to be treated with authority.

PALEONTOLOGIC AND STRATOGRAPHIC MAP OF THE CANANDAIGUA LAKE REGION.—Dr. John M. Clarke, New York State paleontologist, describes (New York State Museum *Bulletin*, No. 52) an effort to portray on maps, with exactitude and fullness, the paleontologic facts, or, in other words, the actual succession of vital events in the earth's history. He selected the Canandaigua Lake region, which has been studied, perhaps, with more care with reference to the succession of its fossil faunæ than any other equal area in the State. The so-called "geologic maps" of to-day do not attempt to represent anything further than the succession of sediments, or lithologic units. Such a map cannot tell the whole truth, for faunas do not vary *pari passu* with sediments. Thus the vital and organic element of the history of the earth is eliminated from these maps. Dr. Clarke has prepared a map of the two quadrangles known as the Canandaigua and Naples sheets, which afford a rock succession of a vertical thickness of about 3,000 feet, on which he has shown the succession and variation of faunas, or what may be termed a true paleontologic map. It is proposed to issue these maps as companion sheets to the geologic map, and to illustrate by means of them the actual relation of the more important variations in faunas to variations in sedimentation.

TOPOGRAPHIC FORMS IN THE CATSKILLS.—The details of the topographic forms in the western portion of the Catskills are admirably illustrated on the map of the Hobart quadrangle, surveyed during the past season. The area covered by this extends for about eight miles in each direction from Stamford as a centre. Immediately south and east of Stamford the country rises rapidly as a massive upland, sloping quite uniformly to the highest summits, of which Mt. Utsyantha is one of the higher peaks in the Catskills, with an altitude of 3,213 feet. Mt. McGregor, about two miles southeast, has an elevation of 3,253 feet. From the former a fine view is had of all of the surrounding country, as it is quite accessible by good wagon road to the observation tower on the summit. A characteristic of this region is the uniformity of slopes produced by long erosion on rocks of the same formation, the drainage lines being deep sunk in the narrow valleys. The margins of these valleys show numerous little hillocks and benches outlining stream deposits, which occurred when the valley bottoms had higher altitudes than those of the present time. The underlying formations appear to have a general inclination to the southward, as the erosion on the northern slopes of all the valleys has produced much steeper gradients on that side than on the southern.

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* Properly *Tarw*, or *Tarwe*.

Another of the high peaks of the Catskills is Blackhead, the altitude of which is 3,937 feet, as shown on the Durham sheet, an old issue of the Geological Survey. Still higher is Hunter Mountain, immediately south of the former, and about ten miles west of Kaaterskill Mountain House, the elevation of this peak being 4,025 feet. Slide Mountain, which is a few miles southwest of Phœnicia, is now definitely proved to be the highest peak in this region, its elevation being 4,204 feet.

H. M. W.

TOPOGRAPHIC SURVEYS IN WESTERN NEW YORK.—An interesting region topographically is that mapped during the past season immediately to the south and west of Rochester, in the neighbourhood of Honeoye Falls, Wayland, Dansville, Geneseo, and Caledonia. This country is on the northern slope of the great central upland, and contains some of the most interesting of the typical smaller Finger Lakes of central New York. The lowland towards Rochester Junction is filled with small hillocks, the morainal deposits from the great glacier which at one time covered the greater portion of New York State. These hillocks are nearly all oval in form, the major axis lying in this neighbourhood almost exactly north and south, thus showing the direction of the movement of the glacier, and having elevations of from 50 to 150 feet above the general elevation of the surrounding country. The positions of old glacial rivers are well outlined, especially immediately to the north of Honeoye, where Honeoye creek now parallels the Lehigh Valley Railroad, the former course of this stream having been about two miles to the south of its present valley. Another old glacial river is well outlined along the line of the Lehigh Valley Railroad immediately east of Caledonia. To the southward of this low morainal area the country rises rapidly, but with comparatively uniform slope, from an altitude of 660 feet at Honeoye Falls to 2,000 feet on the higher divides separating Hemlock and Conesus Lakes. The highest of all these Finger Lakes is probably Canadice, which has an altitude of 1,092 feet, Hemlock Lake being second with an elevation of 896 feet. Both these lakes, but particularly the latter, are deep sunk in narrow valleys excavated by glacial action, and are bordered by very high ridges, which rise with unusual precipitateness from their margins. Thus less than a mile to the east of the shore of Hemlock Lake is Bald Hill, the summit of which has an elevation of 1,840 feet. At three-fourths of a mile west of Hemlock Lake is the summit of Marrowback Hill, the altitude of which is 1,925 feet. The rise is over 1,000 feet in considerably less than a mile, and these slopes are highly eroded by the numerous steep gulleys which serve as watercourses for the rain which falls on the abrupt hillsides.

H. M. W.

THE LEVEL OF GREAT SALT LAKE.—Mr. L. H. Murdoch, Section Director of the United States Weather Bureau at Salt Lake City, has lately been giving considerable attention to the problem of the level of Great Salt Lake (*Monthly Weather Review*, XXIX, 1901, 22–23; XXX, 1902, 482–485). In the *National Geographic Magazine* for February, Mr. Murdoch points out that the reading of the gauge on Dec. 1, 1902, was 3 ft. 5 in. below the zero of the scale, showing a fall of 11 ft. 7 in. since the close of 1886, the year in which the last rise terminated, and a level between 3 and 4 feet below that of 1847. A wet cycle prevailed at Salt Lake City from 1865 to 1886; while from 1887 to 1902 a dry cycle has prevailed, the average precipitation during the latter period being 1.85 in. below normal. Since 1887 there has been a steady decline in the level. While the amount of water used for irrigation has been increasing, Mr. Murdoch does not believe that irrigation can be charged with more than 3 or 4 feet of the last decline of the lake level, and that while the length of the dry period from 1827 to 1864 was 37 years, he does not think that these recurring periods are of equal length. "A wet cycle like that which began in 1865 may begin next year, or it may not begin for fifty or more years." The cycles which Mr. Murdoch finds in the Great Salt Lake region seem, on the whole, to fall in with the 35-year period of Brückner.

R. DE C. W.

COLLECTIONS FOR THE NATIONAL MUSEUM.—The Smithsonian Institution is endeavouring to obtain for the National Museum exhibits illustrating the anthropology of the islands recently brought under the jurisdiction of the United States. Comprehensive suggestions as to the collection of such materials have, therefore, been printed as Part Q of *Bulletin* 39 of the National Museum. Army, navy, and civil officials in the islands are the agents through whom it is believed the larger part of the additions to our anthropological treasures will for the present be made.

EUROPE.

THE PYRENEES AND THE DISTRIBUTION OF ANIMALS.—Dr. R. F. Scharff, of Dublin, read at the Berlin meeting of the International Congress of Geologists, in 1901, a paper on the influence of the Pyrenees on animal distribution, which has recently been published. He pointed out that ranges running east and west, like the Pyrenees, have a greater influence on animal distribution than others, because they stand in the way of northward or southward movement resulting from climatic changes. The identical species on the two sides of the range may either have taken a circuitous route round its ends or crossed the crest when it was lower or had a still milder climate than at present. He believes that animals, like the chamois, crossed the Pyrenees from the east and spread over the Cantabrian Mountains within comparatively recent times. It is, of course, not surprising that the mountains proved no barrier to such animals ; but it is otherwise with reptiles and still lower groups. Many western forms of these crossed into France, no doubt by the lower hills at the extremities of the chain ; while eastern forms also made their way into Spain. The movements of amphibia are subject to many difficulties. Among the salamanders *Molge marmorata* and *M. palmata* seem to have been limited within comparatively recent times to Spain and France respectively ; but each has now crossed the range, though in small numbers, and seems to have utilized the lower western spurs as a point of crossing. An older form (*Salamandra maculosa*) evidently crossed the crest of the range, and is found at an elevation of 5,900 feet. Dr. Scharff arrives at the conclusion that, though causing some hindrance to animal migration, the Pyrenees may easily be turned at their extremities, and that the older forms have, as a rule, crossed the crest of the range, probably in some cases before the glacial epoch. (*The Geog. Jour.*, Feb., 1903.)

KITE METEOROLOGY OF THE WEST COAST OF SCOTLAND.—During the summer of 1902 Mr. W. H. Dines carried out an investigation of the meteorological conditions of the free air off the west coast of Scotland. Kites were flown every day, excepting Sundays, from the deck of a small steam tug, between July 8 and August 26. No difficulty was experienced in starting, flying, or recovering the kites during any weather. The average height reached was 4,000 ft. It was found, among the results of the work (*Quart. Jour. Roy. Met. Soc.*, XXVIII, 300–301), that the temperature gradient over the sea was considerably less than the average value over the land; that the Ben Nevis temperature was lower than that of the air at the same level some sixty miles to the southwestward, and that, as a rule, the humidity increased up to a level of about a mile, and then decreased. This work is interesting to Americans because the suggestion of flying kites for meteorological purposes from the deck of moving vessels came from Mr. A. Lawrence Rotch, of Blue Hill Observatory.

R. DE C. W.

CLIMATIC CONDITIONS FAVOURABLE TO HEATHER.—According to Dr. Paul Graebner, who has made a special study of the moorland heaths of northwestern Germany ("DieVegetation der Erde," edited by Engler and Drude; Vol. V, "Die Heide Norddeutschlands," by Dr. Paul Graebner), the "Heide" area is distinguished from the Steppe region farther east by a moister climate, without long droughts; cooler summers, and less intensely cold winters. In Great Britain, wherever heather and its associates are dominant, similar conditions prevail. The amount of rainfall or of aqueous vapour is considerable and constant; long periods of drought occur rarely; the mean temperature of summer is low; the winter is variable, and ice-bound conditions do not last long.

Although the climatic control of heather is thus emphatic, it does not follow that, given the above conditions, heather must grow. Soil plays a very important part, heather being found characteristically on soils poor in plant food ("The Origin and Development of Heather Moorland," by Dr. W. G. Smith, *Scottish Geographical Magazine*, pp. 587–97, Nov., 1902).

R. DE C. W.

THE KAISER WILHELM CANAL.—While the traffic on the Kaiser Wilhelm Canal is not making rapid development, it is holding its own and slowly increasing. The report on the canal, just issued by the German Government, gives the statistics for the year ending March 31, 1902. The number of vessels of all kinds using the canal increased from 29,045 to 30,161. The tonnage increased from 4,282,094 tons in the previous year to 4,285,301. There was an increased tonnage in Danish, Dutch, and Russian vessels, but a decrease of tonnage in British, German, French, Belgian, Norwegian, and Swedish vessels. Both the receipts and the expenses of the tunnel slightly decreased, the receipts amounting to $530,755 and the expenses to $605,705.

AFRICA.

GEOGRAPHICAL SURVEYS IN MADAGASCAR.—General Gallieni has an article in *La Géographie* (Vol. VI, No. 5) on the geographical surveys of the island since the French occupancy in 1895, with a chart showing the extent of the triangulations carried on between that year and 1901. All the resources of modern scientific geography have been utilized to produce a good map of the island, nine-tenths of which was still unknown previous to the French occupation. Practically the whole of the island has been surveyed, with the exception of a few small forest areas in the northeast and some thorny deserts in the extreme south. The map, based upon these surveys, supplies a great need of the civil and military administration, which had been much embarrassed by lack of good map material. Only the central plateau had been well mapped. The Jesuit Fathers, among the Hovas, had made numerous astronomical and geodetic observations, which supplied the basis for exact and valuable maps of that region. The maps of other parts of the island, based largely upon native reports, were found by the French to be very erroneous.

RAILROAD IN GERMAN SOUTHWEST AFRICA.—The narrow gauge railroad between Swakopmund and Windhoek, in German Southwest Africa, has been completed. It is 237 miles in length and connects the capital and chief settlement of the colony with the sea coast. The region of mountains and deep valleys, among which Windhoek is situated, is well adapted for agriculture and cattle-raising where irrigation is possible. This is apparently the most valuable part of the colony, and is the district to which the Germans are inviting immigration. The railroad is expected, therefore, to be very important in the development of the country. As the region traversed ranges in altitude from sea-level to 5,000 feet, some of the grades are steep, and the passage of the valleys required bridges aggregating 4,600 feet in length. Passenger trains make the journey in two days, spending the night midway at Karibib; freight trains are as yet three to four days on the road.

ACCLIMATIZATION OF THE ENGLISH IN THE UGANDA PROTECTORATE.—In Sir Harry Johnston's book, "The Uganda Protectorate" (London, 1902), the author is very optimistic regarding the future of portions of that country as sanatoria for European colonists. The Nandi plateau, between 7,000 and 10,000 feet in altitude, is "without a single ugly or unfriendly spot. . . . It seems to be awaiting the advent of another race which should make it a wonderland of wealth and comfort, a little England, half a Scotland, or a large Wales, lying exactly under the equator, at an average altitude of 4,000 feet above the Victoria Nyanza." This rosy view of the future colonization of this plateau by British colonists, who shall make their permanent homes and bring up their families there, contradicts the experience of the English in India. In the opinion of a recent reviewer of Sir Harry Johnston's book," the critic who is familiar with the hill sanatoria of the Himalaya and Nilgiri mountains of India will not be convinced that Nandi is likely to be any better fitted for the permanent occupation of British capitalists and labourers, and their reproduction, than Darjeeling, Mussoorie, and Simla; Ootacamund, Coonor, and Kodaikanal."

R. DE C. W.

ASIA.

NAVIGATION ON THE YANGTSE RIVER.—The *Trade Reports* of China for 1901 contain some interesting facts with regard to navigation on the Yangtse. At Hankow, the great tea port on the river, 3,767 vessels, with a total tonnage of 2,678,246, entered and cleared during the year. Twenty-two river steamers run regularly between Hankow and Shanghai, and many ocean-going vessels also visit the port. Two German steamers run regularly between Hankow and Swatow, and eight tea steamships cleared for Odessa with cargoes of tea. Hankow is thus a river seaport, and is the furthest point inland in China to which ocean steamers penetrate. At Ichang, about 1,000 miles up the Yangtse, 348 steamers, with a total tonnage of 305,674, entered and cleared during the year. Many of these vessels are stern-wheel boats. As the number of steamers increases the junk trade diminishes, though it is still very large. The rapids, which obstruct navigation on the upper Yangtse, begin some distance above Ichang. A few small steam vessels have succeeded in getting through these rapids to Chungking, the great commercial centre of Szechuan; but the general opinion now is that steamers can be practically useful in this stretch of the river only for towing boats between the rapids, and that improved machinery and a better organization of labour must be utilized to get freighters through the most difficult parts of the river.

POLAR.

BARON TOLL'S EXPEDITION.—News of Baron Toll's party, received in Russia last fall, contained the surprising information that he was supposed to be on the little-known Bennett Island, north of the New Siberia group; also that his zoologist, Birula, was on New Siberia Island. Toll and the astronomer Seeberg left the winter quarters of their vessel, *Zaria*, on Kotelnoi Island in May last for Bennett Island. Birula and some natives had already started for New Siberia Island. The *Zaria* was instructed to visit these islands for the purpose of carrying the explorers back to camp as soon as the ice conditions permitted the vessel to go north. The *Zaria* left Kotelnoi early in July, but was unable to reach either Bennett or New Siberia Islands on account of the ice pack. Last fall the *Zaria*, with all the other members of the expedition, went south to the mainland, taking up winter quarters at the mouth of the Lena. Lieutenants Matissen and Koltchak, with nine men, returned to St. Petersburg in January, and reported that a relief party was to leave the *Zaria* by sledge for Kotelnoi, in the belief that the three explorers had probably made their way over the ice to that island. No special anxiety as to their fate is yet felt, as they had in view the possibility that the vessel might not reach them, and they might be compelled to winter on the islands which they intended to visit.

THE SPITZBERGEN DEGREE MEASUREMENT.—In 1898 Swedish and Russian expeditions began operations for the measurement of an arc of the meridian, the Swedes occupying the more northern and the Russians the more southern parts of the Spitzbergen group. The work has been spread over five summers, in some of which little was accomplished owing to unfavourable weather conditions. It was completed last summer, when the Swedish expedition returned home after having effected a junction with the Russian net of triangles in the south.

THE GERMAN ANTARCTIC EXPEDITION.—The joint publication of the Berlin Institute for Oceanography and Geography, Part II, announces that the *Gauss* arrived at Kerguelen on January 2, 1902, where it met the land party that had previously reached the headquarters in Observatory Bay with supplies. On January 31 the *Gauss* sailed for her destination in the Antarctic with provisions for nearly three years. Dr. von Drygalski, leader of the expedition, intended, if possible, to land on Heard Island and then make straight for Wilkes's Termination Island, skirting the ice towards the west to take advantage of the prevailing easterly winds and ultimately turning southward and entering the ice. He thought it likely that the *Gauss* might lose some of her gear in the ice, and desired to caution friends at home not to infer that the expedition had met with disaster if pieces of wreckage from his vessel were picked up. He said he might be able to send news home by June, 1903; but, as the expedition is planned for three summers in the ice, no news will be good news till June, 1904.

AUSTRALASIA.

GLACIATION IN AUSTRALIA.—Mr. J. P. Thomson, in an address before the Royal Geographical Society of Australasia, Queensland, on September 22, 1902, said:

> To my mind, no satisfactory evidence of well-defined traces of glaciation in Australia has yet been brought forward. Drift ice masses may probably have left their imprints on some of the shore rocks of former estuarial channels, but there is nothing to indicate that the whole of the continent was at any time involved in extensive ice-sheets. In point of fact, the past and present fauna and flora denote the occurrence of mild climatic conditions which have prevailed for ages—conditions of climate partaking more of the tropical than the Arctic character.

Mr. Thomson adds, however, that after writing the above the newspapers reported that Mr. A. Gibb, Government Geologist for Western Australia, had reported that on his trip from Cue, the centre of the Murchison goldfield, to Carnarvon, between the heads of the Woramel and Minilya Rivers, he discovered, associated with carboniferous rocks, an extensive deposit of glacial origin. He traced this deposit over sixty or seventy miles. With it were a large number of ice-scratched boulders.

GENERAL.

EARTHQUAKE OBSERVATIONS.—In his paper on "Seismological Observations and Earth Physics" (*The Geog. Jour.*, Jan., 1903), Mr. John Milne divides earthquakes into two groups: First, those which disturb continental areas and frequently disturb the whole world as a whole; and, secondly, local earthquakes, which usually disturb only an area of a few miles' radius, and seldom extend over an area with a radius of 100 and 200 miles. He endeavours to show that the former are the result of sudden accelerations in the process of rock-folding accompanied by faulting and molar displacements of considerable magnitude, while the latter are for the most part settlements and adjustments along the lines of their primary fractures. A long series of observations justified Mr. Milne in saying (1883) that "it is not unlikely that every large earthquake might with proper appliances be recorded at any point on the land surface of the globe." This statement was not fully accepted until six years later, when it was found that the photographic records of the displacements of a horizontal pendulum showed abnormal movements that were traced to earthquakes which had originated at great distances from the observing station. From this time seismologists had before them a new field for research, and stations to record world-disturbing earthquakes are now to be found in very many countries. The most complete organization of stations is that working in co-operation with a committee of the British Association. There are now thirty-eight of these stations scattered all over the world, and their seismological observations are published semi-annually.

THE BRITISH PACIFIC CABLE.—The British cable, laid between Vancouver, British Columbia, and Brisbane, Queensland, completed last fall, is the last link in a girdle of British telegraph lines extending around the world. With the exception of two landing-places in Portuguese territory, at Madeira, and at St. Vincent, on the Cape Verde Islands, all the landings are in British territory. The line between Vancouver and the North Island of New Zealand is over 8,000 miles in length. It is extended from New Zealand to Norfolk Island and Brisbane. Between Vancouver and New Zealand the only landing-places are at Fanning Island and the Fiji Islands. The longest stretch of cable between landing-places is from Vancouver to Fanning Island, 3,600 miles. The greatest depth at which the cable was laid was 19,200 feet, the average depth being 16,200 feet. The cable was opened for business about the middle of December, and it is now possible to send a message around the world in thirty minutes. This great undertaking was not carried out without much opposition, particularly on the part of the cable lines between Australia and the Malay Archipelago which connect with Europe.

WEATHER AND TRAIN LOADS.—A recent number of the *Monthly Weather Review* calls attention to the fact that the load which an engine is given to draw is, in many cases, regulated by the weather forecast. Thus, in the case of freight trains leaving Pittsburg for the West and Northwest, there are four classes of train loads, arranged alphabetically, depending upon the kind of weather which is expected. If the report is for favourable weather, the engine's load (A) is 1,750 tons. When there is a reasonably good weather report the locomotive's load is limited to 1,625 tons (B). Worse weather means a load of 1,475 tons (C), and very bad weather reduces the load to 1,225 tons. In the case of stock trains, Class A is 1,450 tons, and for high-class freight running at higher speed than ordinary freight Class A means 1,525 tons per train. The same allowance is made for the three lower classes as noted above.

R. DE C. W.

EFFECT OF DOUBLE WINDOWS ON TEMPERATURE.—H. Dufour has made a study of the effect of double windows in keeping out winter cold (*Arch. Sci. phys. et nat.*, Geneva). He placed one thermometer in the outside air, about 4 inches away from an east window; another was fastened between the two windows, 1½ inches from the inside window, and the third was in the middle of the room. The space between the windows was 8¼ inches. The results of observations during one winter were as follows:

OUTSIDE.	BETWEEN WINDOWS.	DIFFERENCE.	ROOM.
25.2° calm	37.4°	12.2°	56.3°
23° moderate wind	35.6°	12.6°	59°
17.6° high wind	33.3°	15.7°	57.2°
23° " "	38.3°	15.3°	55.4°
30.7° calm	41.0°	10.3°	57.2°

The differences were 11–13° in calms, and rose to between 15° and 16° when there was a high wind.

R. DE C. W.